

PROJECT: 063-007

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HALOGENATED VOLATILE ORGANIC  
COMPOUND (HVOC)  
SOIL INVESTIGATION  
POWERINE REFINERY  
12345 LAKELAND ROAD  
SANTA FE SPRINGS, CALIFORNIA

January 3, 1997

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Prepared for:

Powerine Oil Company  
12354 Lakeland Road  
Santa Fe Springs, CA 90670

Prepared by:

TriHydro Corporation  
920 Sheridan Street  
Laramie, WY 82070



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**TriHydro Corporation**

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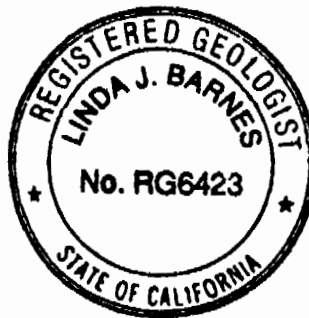
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LOS ANGELES REGION

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CERTIFICATION

I certify that the work presented in this report was performed under my supervision. To the best of my knowledge, the data contained herein are true and accurate and the work was performed in accordance with professional standards.

 1/3/97  
Linda J. Barnes Date  
California Registered Geologist #6423  
License expires October 31, 1997



 1-3-97  
Henry Richter Date  
President  
TriHydro Corporation

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## Introduction

Powerine Oil Company (POC) recently completed a soil gas survey and shallow soils investigation at the Powerine Refinery (12345 Lakeland Road) in Santa Fe Springs, California (Figure 1). The assessment consisted of the following activities:

1. Installation of 13 soil gas testholes drilled to a depth of 5 feet below ground surface (ft-bgs);
2. Analysis of 13 soil gas samples for halogenated volatile organic compounds (HVOCs) by EPA Method 8010 using an onsite mobile laboratory;
3. Installation of three soil borings drilled to an average depth of 19 ft-bgs; and
4. Analysis of six soil samples for HVOCs by EPA Method 8010 using an onsite mobile laboratory.

The soil gas sampling was performed by a RWQCB-listed soil gas consultant (Matrix Analytical Services, Inc., Torrance, California). Field activities were conducted in compliance with the Regional Water Quality Control Board (RWQCB) Interim Guidance For Active Soil Gas Investigation (March 1996) and the RWQCB-approved Workplan dated June 21, 1996. Powerine received approval for a supplement to the workplan dated November 14, 1996.

## Investigation Background

Groundwater data obtained by POC during December 1995-January 1996 showed the presence of dissolved halogenated volatile organic compounds (HVOCs) in the vicinity of the Powerine Refinery. HVOCs detected in groundwater samples at concentrations above method detection limits included; vinyl chloride; 1,1-dichloroethene; methylene chloride; t-1,2-dichloroethene; 1,1,-dichloroethane; c-1,2-dichloroethene; 1,1,1-trichloroethane; 1,2-dichloroethane; 1,2-dichloropropane; trichloroethene; and tetrachloroethene. In the HVOC investigation workplan dated June 21, 1996, POC indicated that the HVOCs appeared to be migrating from sources located up-gradient and side-gradient to the refinery.

This investigation was initiated by POC to evaluate whether the HVOCs detected in groundwater may have resulted from HVOC handling and storage activities at the Powerine Refinery. The area to the west of the Powerine Laboratory was selected for the investigation, because it is reported to have been the primary location of HVOC storage and handling. As indicated in the investigation workplan dated June 21, 1996, the following HVOCs are reported to have been stored in this area:

1. Carbon tetrachloride, 1,2-dichloroethane, propylene dichloride, and tetrachloroethene were injected in trace concentrations into petroleum product to maintain acidic reaction sites in unit catalysts.
2. 1,2-dichloroethane was used in trace concentrations in gasoline to scavenge tetraethyl lead.

## Soil Gas Investigation Procedures

The soil gas investigation was conducted on November 19, 1996. Thirteen soil gas testholes were constructed to a depth of 5 ft-bgs at the locations shown on Figure 2. Photodocumentation of the soil gas sampling procedures is included in Appendix A. Drilling and sampling procedures and the results of the field screening and laboratory analyses are provided in the following sections.

### Soil Vapor Testhole Installation

The soil gas testholes were drilled by Vironex Inc. (El Segundo, California) using a hydraulic direct-push/percussion probing system ("Geoprobe"). Underground utilities were marked prior to drilling activities. In addition, field personnel used a hand auger to verify that no underground conflicts were present prior to drilling. At each location where utilities were cleared by hand augering, three hand auger holes were sited in a triangle pattern around the soil gas testhole. By use of the triangulation procedure, the soil gas testhole location was not disturbed prior to installation of the sampling point.

A retractable stainless steel drive point was attached to the outer drive rods of the hydraulic probe, and pushed/driven to a depth of 5 ft-bgs. A threaded hose barb was attached to 3/8-inch diameter polyethylene tubing, lowered inside the outer drive rods and threaded into the sampling point. The outer drive rods were retracted by approximately four inches exposing the perforated inner rod and sampling point to soil vapors. The threaded connection between the drive point and the polyethylene tubing provided a closed system and prevented dilution of the soil gas by ambient air. The polyethylene tubing was fitted to a 6-inch length of silicone tubing which was connected to the vapor pump. The soil gas was then pumped at a known flow rate to evacuate the appropriate volume of soil gas prior to sampling. Flow rate was monitored during evacuation to assure that samples were not collected under a partial vacuum. In accordance with RWQCB protocol, the appropriate purge volume was established by conducting a purge test prior to the investigation (described in the following sections). Soil vapor samples were drawn through a syringe inserted into the silicone tubing and submitted to the mobile laboratory for immediate analysis.

### Soil Vapor Sampling and Analysis

Soil vapor samples were collected by purging the appropriate volume of vapor from the testhole and then inserting a syringe into the tubing and extracting representative vapor. Vapor samples were transported directly to the onsite mobile laboratory for immediate analysis. The samples were analyzed for the HVOCs on the primary target list in Section 3.1 of the RWQCB soil gas guidance document. This list includes all of the HVOCs which were reported to have been detected in groundwater and/or handled at the refinery except for 1,2-dichloropropane.



## Soil Gas Survey Quality Assurance

The soil gas testhole drilling and sampling were performed by RWQCB-listed soil gas consultants (Vironex, El Segundo, CA; Matrix Analytical Services, Inc., Torrance CA). The soil gas survey was conducted in accordance with RWQCB protocol. All soil gas samples were analyzed within 30 minutes of collection. Chain-of-custody information was documented for each sample. The completed chain-of-custody forms are included in Appendix B. The surrogate bromofluorobenzene was added to each sample prior to analysis. One field duplicate vapor sample (at LB-13) was collected. Ambient air blanks were collected immediately before and after the soil gas investigation. A syringe blank was collected at the start of the investigation. None of the target constituents were detected above the PQL in any of the syringe or ambient blanks. Analytical results were calculated during the field investigation, and preliminary data was provided to field team members prior to leaving the site.

### Purge Volume Versus Contaminant Concentration Test

At the start of the soil gas survey, a purge volume versus concentration test was conducted at testhole LB-5. The results of the purge test are shown in Table 1. The maximum concentrations of the detected constituents ethylbenzene and total xylenes were obtained after purging 100 - 200 ml of gas. No HVOCs were detected during the purge test.

Section 2.2 of the RWQCB protocol indicates that optimum purge volume may be compound specific. The target compounds in this investigation were typically heavy chlorinated hydrocarbons that would be expected to have elution behavior similar to or slower than that of xylene.

### Purge Volume Verification Test

The PID was fitted with an 11.7 eV lamp so that it was capable of detecting the target HVOCs, if present. The PID was calibrated to a 100 ppm hexane standard, and its functioning was checked immediately prior to performing the purge volume verification test at LB-5. The pumping rate of the PID (250 ml/min) was estimated by measuring the time required for the PID to completely evacuate a fully inflated 1 liter tedlar bag.

The purge volume verification test was conducted following completion of the purge test described in the previous section. The soil gas sampling point was allowed to sit undisturbed for five minutes prior to conducting the purge volume verification test. The PID wand was then fitted to the testpoint polyethylene tubing and the total organic vapor (TOV) concentration monitored until it stabilized. The PID was fitted with an 11.7 eV lamp so that it was capable of detecting the target HVOCs, if present. The PID was calibrated to a 100 ppm hexane standard, and its functioning checked immediately prior to performing the purge volume verification test at LB-5. The pumping rate of the PID (250 ml/min) was estimated by measuring the time required for the PID to completely evacuate a fully inflated 1 liter tedlar bag.

The maximum and final TOV concentrations were recorded. The TOV concentrations were observed to rise steadily during the first 15 - 30 seconds of purging (60 - 125 ml) and then to stabilize at or near the maximum for a period of greater than 1 minute (250 ml).

Based on these results, a purge volume of 200 ml was determined to be appropriate for detecting HVOCs (if present) at this site.

TOV was measured at each of the testpoints following collection of the soil gas sample. At each location, TOV was observed to stabilize at or near the maximum concentration after purging for a period of approximately 30 seconds (100 ml).

### Soil Gas Survey Results

The soil gas survey results are shown on Figure 3. Laboratory analytical reports are presented in Appendix C. Chain-of-custody forms for submitted samples are included in Appendix B. Soil vapor analyses by EPA Method 8010 were conducted by the onsite mobile laboratory (Matrix Analytical Services, Inc., Torrance, California). Laboratory quality assurance/quality control (QA/QC) data were determined by the laboratory to be within acceptable limits for the analytical methods. HVOCs were not detected in any of the 13 samples or one field duplicate analyzed.

Detected TOV concentrations determined during field screening ranged between 2 and 81 parts per million volume (ppmv; reference Figure 3). The relative TOV concentrations were used to site soil sampling locations. The soil sampling procedures and results are described in subsequent sections of this report.

### Soil Sampling Investigation Procedures

The soil sampling investigation was conducted November 22, 1996. Three soil borings were installed and a total of six soil samples collected for analysis of HVOCs by EPA Method 8010. The RWQCB-approved workplan indicated that soil sampling would be conducted at the three locations of the greatest potential HVOC impacts, based on the soil gas survey. However, HVOCs were not detected in any of the soil gas samples. Therefore, one soil boring was constructed in each of three areas with the following rationale:

- LBS-5: The location in the northwestern part of the investigation area where the highest TOV concentration (81 ppmv) was detected during the soil gas survey.
- LBS-10: The location in the southern part of the investigation area where the highest TOV concentration (47 ppmv) was detected during the soil gas survey.
- LBS-11: The location in the eastern part of the investigation area, where the highest TOV concentration (11 ppmv) was detected during the soil gas survey. This location was also in the vicinity of the former storage tanks and oil water separator (Figure 3).

Borehole locations are shown on Figure 2. The boreholes were drilled to an average depth of 19 feet below ground surface (ft-bgs). Lithologic descriptions for each borehole

were recorded on log-of-borehole forms (included in Appendix D). Field activities were supervised by a California Registered Geologist.

#### Borehole Drilling

The boreholes were drilled by Vironex Inc. (El Segundo, California) using a hydraulic direct-push/percussion probing system ("Geoprobe") mounted on a pickup truck. Underground utilities were marked prior to drilling activities. Sampling was conducted within 2 feet of the respective soil gas survey testhole locations.

#### Soil Sample Collection

Soil samples were collected at five foot intervals using a two-foot long, 1.25 inch diameter hollow tube sampler, fitted with four 6-inch long brass liners. After each sampled interval was brought to the surface, the brass liners containing the soil sample aliquots were removed from the sampler and handled as follows:

- One liner was checked to ensure that it contained no headspace and then immediately capped with teflon sheeting and plastic end caps and placed on ice for possible laboratory analysis.
- An aliquot of soil from one of the remaining liners was placed into a sealed plastic bag for lithologic logging and soil gas headspace field screening. The uppermost 6-inch liner was discarded because of the potential for including slough in this interval.
- Lithology and soil gas headspace field screening results were recorded for each sample interval. Samples for laboratory analysis were then selected based on results of the field screening and lithologic logging using the criteria described in the workplan.
- One brass liner was then immediately submitted to the mobile laboratory for the analyses of HVOCs by EPA Method 8010.

The plastic bag containing the field screening aliquot of soil sample was shaken to enhance volatilization and allowed to equilibrate to ambient temperature. Each soil sample was field screened by inserting the probe of a photoionization detector (PID; with a 10.6 eV lamp) through a small hole in the plastic bag and measuring the headspace total organic vapor (TOV) concentrations. The PID was calibrated prior to use with a factory prepared 100 parts per million (ppm) hexane standard. The PID was checked at regular intervals throughout the investigation to ensure accurate TOV measurements.

The highest TOV field screening measurement was recorded for each sampled interval. The TOV concentrations are reported relative to the hexane standard. Borehole logs containing lithologic descriptions and TOV field screening results are provided in Appendix D. Table 2 summarizes TOV readings by depth for each borehole.

### Equipment Decontamination

All downhole drilling and sampling equipment was decontaminated prior to use at each borehole and sampling interval. The samplers were scrubbed with a brush in a detergent and water wash and rinsed with water. All drilling equipment was steam cleaned. Decontamination water was contained in 55-gallon drums and transported to the refinery for disposal/recycling.

### Borehole Abandonment/Soil Cuttings Disposal

Boreholes were filled with bentonite granules. Contaminated soils generated during drilling and sampling were placed in a single 55-gallon drum, labeled, with borehole name and depth intervals, and temporarily stored at the site pending appropriate handling by Powerine personnel.

### Laboratory Analyses

As outlined in the Approved June 21, 1996 Workplan and subsequent supplement/clarification dated November 14, 1996, soil samples were submitted to a State certified (onsite) mobile laboratory for analyses of HVOCs by EPA Method 8010. The soil analytical list included all of the HVOCs that were reported in the workplan to have been detected in groundwater and/or handled at the refinery. In each of the three boreholes, one sample was collected from a depth of 5 ft-bgs; in accordance with the July 8, 1996 RWQCB request, a second sample was collected from the bottom of each borehole.

### Soil Quality Analytical Results

Soil analyses by EPA Method 8010 were conducted by an onsite mobile laboratory (Jones Environmental Testing Laboratories, Fullerton, California). Laboratory quality assurance/quality control (QA/QC) data were determined by the laboratory to be within acceptable limits for the analytical methods.

The soil analytical results from the HVOC investigation are presented on Figure 3. Laboratory analytical reports are presented in Appendix E. Chain-of-custody forms for the submitted samples are included in Appendix F. As shown on Figure 3, HVOCs were not detected in any of the soil samples.

### Recommendations/ Conclusions

The purpose of this HVOC investigation was to evaluate whether previously detected concentrations of HVOC constituents in groundwater may have resulted from possible releases of HVOCs (if any) from the Powerine refinery. These detections have occurred at the periphery of the Powerine refinery, in the side-gradient and up-gradient directions from refinery activities. The area of this investigation, located immediately to the west of the

Powerine Laboratory, was selected because it was reported to be the area where HVOCs have been historically stored and handled at the refinery. None of the target HVOCs were detected in the vapor samples or soil samples collected during this investigation.

The results of this investigation provide no evidence of the presence of any target HVOCs in the shallow soil and soil vapor in the areas drilled. Because no evidence of target HVOCs were encountered during this drilling investigation, it does not seem likely that a release from this HVOC storage area contributed to the HVOC concentrations that have been detected in the groundwater side-gradient or up-gradient of the Powerine Refinery.

## TABLES

Table 1. Purge Volume Versus Contaminant Concentration Test Results, HVOC Investigation, Powerine Refinery, 12345 Lakeland Road, Santa Fe Springs, CA (11/96).

Location	Purge Time (sec)	Purge Volume (ml)	Ethylbenzene (µg/l)	Total Xylenes (µg/l)	All Others
LB-5	15	50	1.3	ND	ND
LB-5	30	100	1.6	1.2	ND
LB-5	60	200	1.2	2.1	ND

ND = Not Detected (includes all compounds listed in Section 3.1 of RWQCB Soil Gas Investigation Interim Guidance Document, March 1996)

Note: one column volume of vapor estimated to be 25 ml

Table 2.

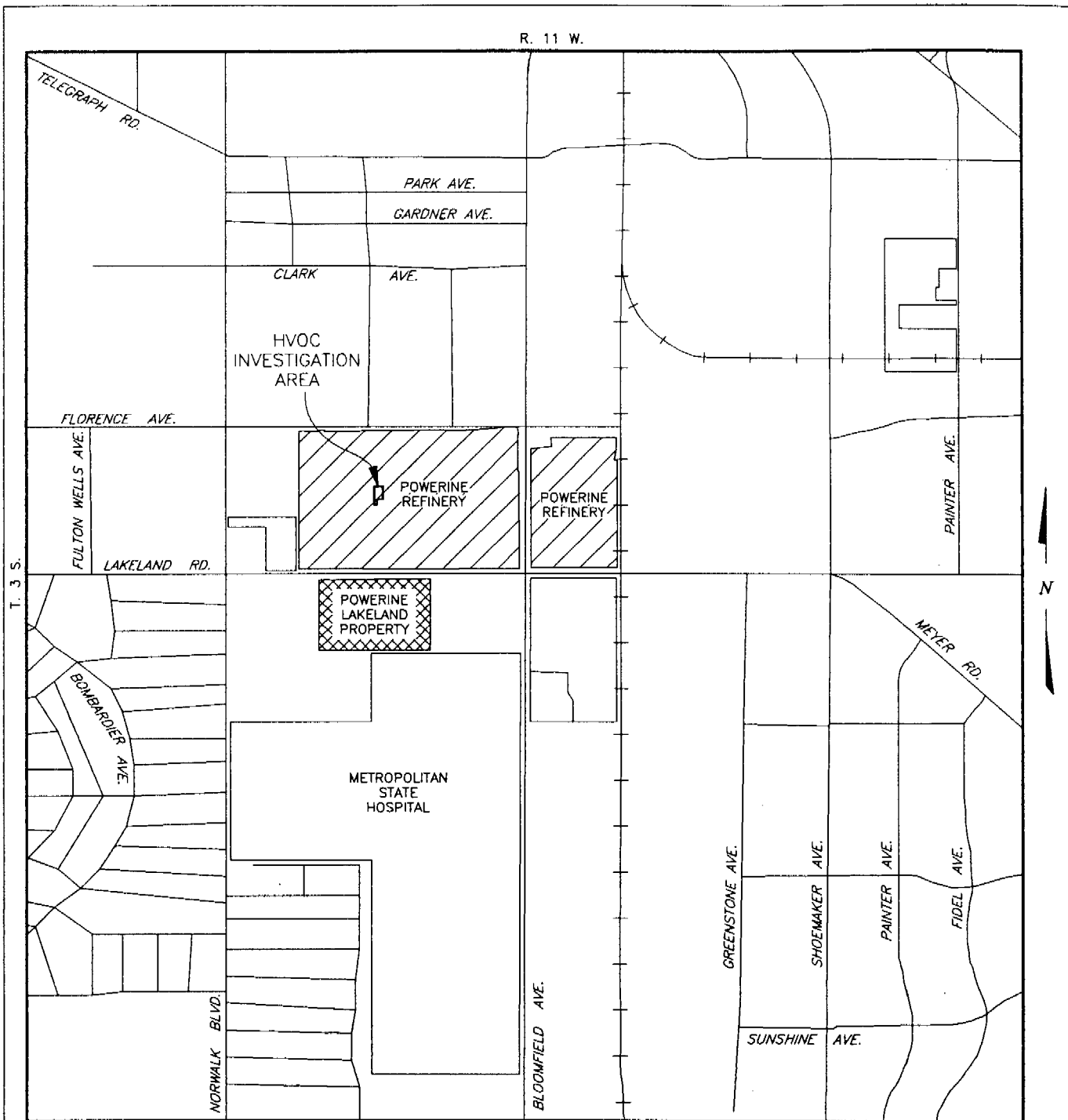
Summary of Total Organic Vapor Readings Measured with a PID (10.6eV), HVOC Investigation, Powerine Oil Company, Santa Fe Springs, California.

	Sampling Interval (in ft-bgs)				
	1 - 3	4 - 6	9 - 11	14 - 16	19 - 21
Borehole	Total Organic Vapor Reading (in ppm as hexane)				
LBS-5	OR	OR	47	13	31
LBS-10	OR	OR	OR	OR	OR
LBS-11	264	9	67	22	27

Notes: -- = no PID reading for sampling interval  
 OR = Overrange reading on PID (>2000 ppm)



FIGURES

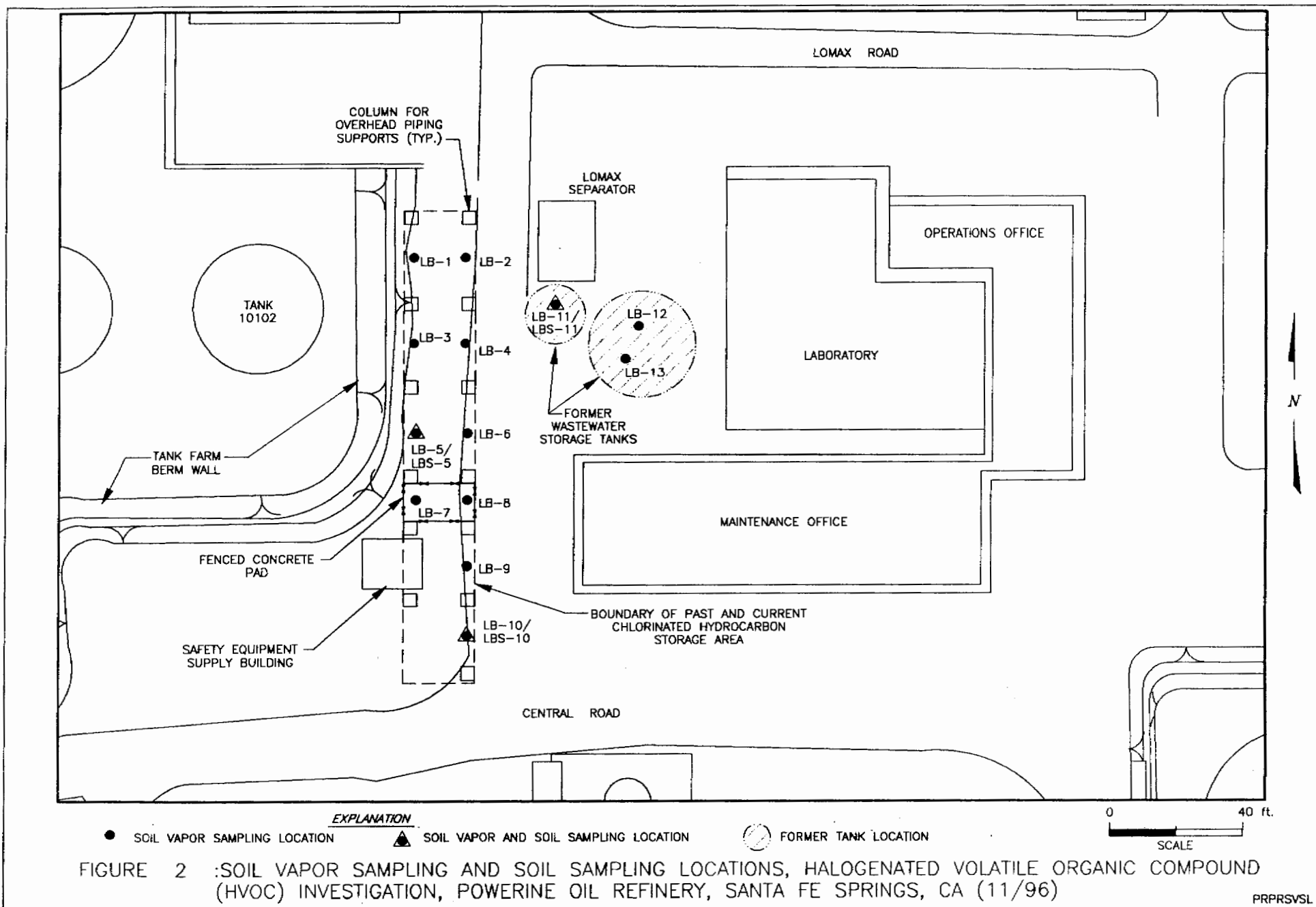


Note: Property boundaries are approximate.

0 1000 ft.  
SCALE

FIGURE 1 :GENERAL LOCATION MAP, HVOC INVESTIGATION AREA, POWERINE REFINERY AND LAKELAND PROPERTY, SANTA FE SPRINGS, CALIFORNIA

PRAREAHV



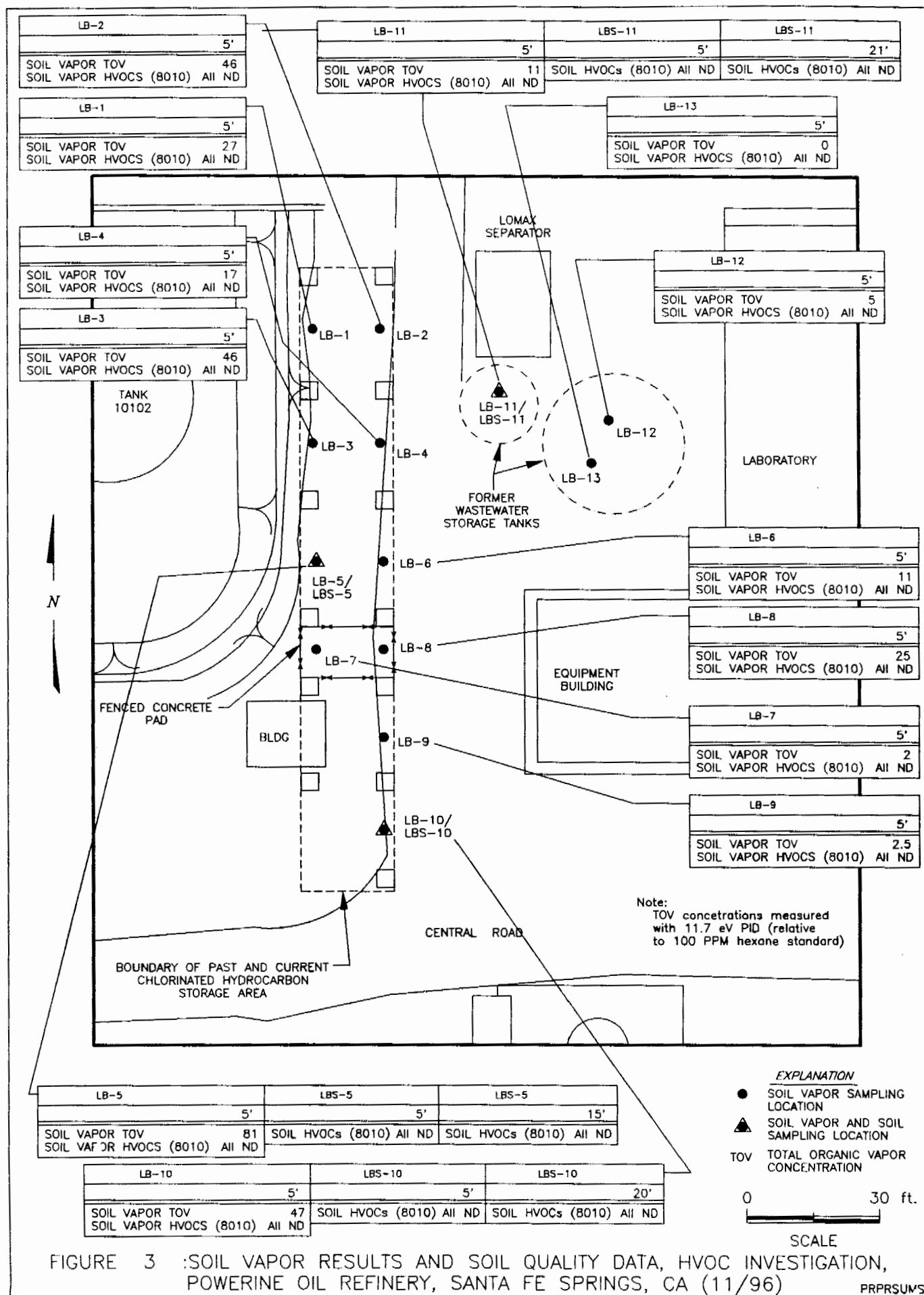


FIGURE 3 :SOIL VAPOR RESULTS AND SOIL QUALITY DATA, HVOC INVESTIGATION, POWERLINE OIL REFINERY, SANTA FE SPRINGS, CA (11/96)

PRR/SUMS

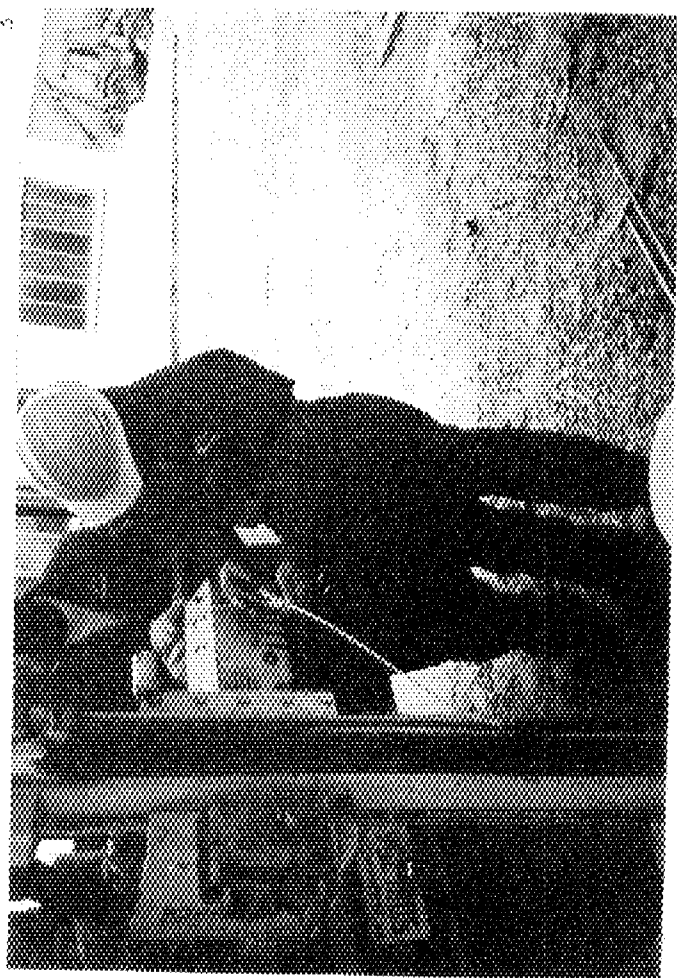
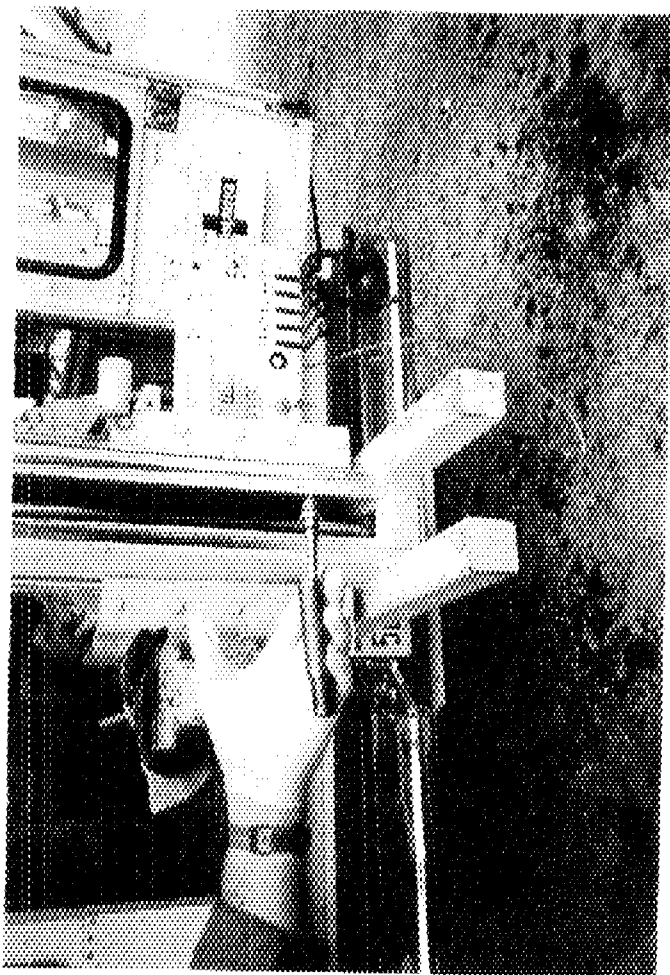
APPENDIX A

PHOTODOCUMENTATION OF SOIL GAS SURVEY FIELD ACTIVITIES  
HVOC INVESTIGATION  
POWERINE REFINERY  
SANTA FE SPRINGS, CA

PHOTODOCUMENTATION OF SOIL GAS SURVEY FIELD ACTIVITIES  
HVOC INVESTIGATION  
POWERINE REFINERY  
SANTA FE SPRINGS, CALIFORNIA

Photo

1. Retractable soil gas testpoint. Testpoint was threaded into the outer drive rods and pushed/hammered to the desired sampling depth.
2. View of the threaded hose barb connected to polyethylene tubing. The threaded hose barb was inserted within the outer probe rods and threaded into the soil gas testpoint. The outer rods were then partially withdrawn, exposing the testpoint. The threaded connection acted to seal off the testpoint and prevent dilution from ambient air.
3. View showing the soil gas consultant sampling using a syringe.
4. Field screening of the soil vapors with a photoionization detector (PID). The PID screening was performed after the soil vapor sample was collected. An 11.7 eV lamp was used to allow for detection of chlorinated compounds of interest. The highest total organic vapor concentration (TOV) was recorded. The TOV concentrations generally stabilized after 15 - 30 seconds (approximately 60-125 ml).



APPENDIX B

CHAIN-OF-CUSTODY FORMS  
SOIL GAS SURVEY  
HVOC INVESTIGATION  
POWERINE REFINERY  
SANTA FE SPRINGS, CA





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APPENDIX C

ANALYTICAL DATA (EPA METHOD 8010)

SOIL GAS SURVEY

HVOC INVESTIGATION

POWERINE REFINERY

SANTA FE SPRINGS, CA



November 30, 1996

Charlie DeWolf  
TriHydro Corporation  
920 Sheridan St.  
Laramie, Wyoming 82070

**RE: Powerine Refinery Soil Investigation/12354 Lakeland Rd., Santa Fe Springs**

Dear Mr. DeWolf:

Enclosed are analytical results for samples analyzed by our mobile laboratory in the field November 19, 1996, referenced under Matrix Work Order No. MNOV1996.

A formal Quality Assurance/Quality Control (QA/QC) program is maintained by Matrix, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes.

Matrix Analytical Services, Inc. is approved to perform environmental analyses by California's Department of Health Services Environmental Laboratory Accreditation Program (ELAP) under Certification #2008.

Please contact me if you have any questions or if I can be of further assistance.

Sincerely,

Matrix Analytical Services, Inc.

William M. Jow, Jr.  
Laboratory Director  
encl.

Client: **Powerine Oil Company**  
 Project: **Powerine Refinery Soil Investigation**  
 Project Location: **12354 Lakeland Rd., Santa Fe Springs**  
 Work Order Number: **MNOV1996**

**ANALYTICAL RESULTS**  
 Halogenated Volatile Organics by Gas Chromatography  
 EPA Method 8010<sup>a</sup>

Lab ID Number	1	2	3	4	
Client Identification	SyringeBlank	Equip. Blank	Ambient 0700	LB5-5 ' 2Vol.	
Date Sampled	11/19/96	11/19/96	11/19/96	11/19/96	
Date Analyzed	11/19/96	11/19/96	11/19/96	11/19/96	
Reporting Limit Multiplier	1	1	1	1	
Analyte	Reporting Limit,ug/L	Concentration, ug/L			
Freon 113	1	ND	ND	ND	ND
Carbon Tetrachloride	1	ND	ND	ND	ND
Chloroethane	1	ND	ND	ND	ND
Chloroform	1	ND	ND	ND	ND
Dichlorodifluoromethane	1	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	1	ND	ND	ND	ND
1,2-Dichloroethane (1,2-DCA)	1	ND	ND	ND	ND
1,1-Dichloroethylene (1,1-DCE)	1	ND	ND	ND	ND
trans-1,2-Dichloroethylene	1	ND	ND	ND	ND
Dichloromethane (Methylene Chloride)	1	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	1	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND
Tetrachloroethylene (PCE)	1	ND	ND	ND	ND
1,1,1-Trichloroethane (111-TCA)	1	ND	ND	ND	ND
1,1,2-Trichloroethane (112-TCA)	1	ND	ND	ND	ND
Trichloroethylene (TCE)	1	ND	ND	ND	ND
Trichlorofluoromethane	1	ND	ND	ND	ND
Vinyl chloride	1	ND	ND	ND	ND
cis-1,2-Dichloroethylene	1	ND	ND	ND	ND
SURROGATE: 4-Bromofluorobenzene <sup>b</sup>		95.5	82.7	83.3	75.5

<sup>a</sup> Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA SW-846, Third Edition, Revision 1. US EPA July 1992/Organics in Water, EPA Method 601; "Test Procedures for Analysis of Organic Pollutants," Code of Federal Regulations, 40CFR Part 136, Appendix A, July 1992. <sup>b</sup> Surrogate recovery acceptability limits: 60-140%.

ND=Not Detected at or above the Reporting Limit



MATRIX ANALYTICAL SERVICES, INC.

Client: **Powerine Oil Company**  
 Project: **Powerine Refinery**  
 Project Location: **12354 Lakeland Rd., Santa Fe Springs**  
 Work Order Number: **MNOV1996**

ANALYTICAL RESULTS  
 Halogenated Volatile Organics by Gas Chromatography  
 EPA Method 8010<sup>a</sup>

Lab ID Number	5	6	7	8	
Client Identification	LB5-5' 4Vol.	LB5-5' 8Vol.	LB1-5'	LB2-5'	
Date Sampled	11/19/96	11/19/96	11/19/96	11/19/96	
Date Analyzed	11/19/96	11/19/96	11/19/96	11/19/96	
Reporting Limit Multiplier	1	1	1	1	
Analyte	Reporting Limit,ug/L	Concentration, ug/L			
Freon 113	1	ND	ND	ND	ND
Carbon Tetrachloride	1	ND	ND	ND	ND
Chloroethane	1	ND	ND	ND	ND
Chloroform	1	ND	ND	ND	ND
Dichlorodifluoromethane	1	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	1	ND	ND	ND	ND
1,2-Dichloroethane (1,2-DCA)	1	ND	ND	ND	ND
1,1-Dichloroethylene (1,1-DCE)	1	ND	ND	ND	ND
trans-1,2-Dichloroethylene	1	ND	ND	ND	ND
Dichloromethane (Methylene Chloride)	1	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	1	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND
Tetrachloroethylene (PCE)	1	ND	ND	ND	ND
1,1,1-Trichloroethane (111-TCA)	1	ND	ND	ND	ND
1,1,2-Trichloroethane (112-TCA)	1	ND	ND	ND	ND
Trichloroethylene (TCE)	1	ND	ND	ND	ND
Trichlorofluoromethane	1	ND	ND	ND	ND
Vinyl chloride	1	ND	ND	ND	ND
cis-1,2-Dichloroethylene	1	ND	ND	ND	ND
SURROGATE: 4-Bromofluorobenzene <sup>b</sup>	78.5	84.4	83.2	86.3	

<sup>a</sup> Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA SW-846. Third Edition, Revision 1. US EPA July 1992/Organics in Water, EPA Method 601; "Test Procedures for Analysis of Organic Pollutants," Code of Federal Regulations, 40CFR Part 136, Appendix A, July 1992. <sup>b</sup> Surrogate recovery acceptability limits: 60-140%.

ND=Not Detected at or above the Reporting Limit



MATRIX ANALYTICAL SERVICES, INC.

Client: **Powerine Oil Company**  
 Project: **Powerine Refinery**  
 Project Location: **12354 Lakeland Rd., Santa Fe Springs**  
 Work Order Number: **MNOV1996**

ANALYTICAL RESULTS  
 Halogenated Volatile Organics by Gas Chromatography  
 EPA Method 8010<sup>a</sup>

Lab ID Number	9	10	11	12	
Client Identification	LB3-5'	LB4-5'	LB6-5'	LB7-5'	
Date Sampled	11/19/96	11/19/96	11/19/96	11/19/96	
Date Analyzed	11/19/96	11/19/96	11/19/96	11/19/96	
Reporting Limit Multiplier	1	1	1	1	
Analyte	Reporting Limit,ug/L	Concentration, ug/L			
Freon 113	1	ND	ND	ND	ND
Carbon Tetrachloride	1	ND	ND	ND	ND
Chloroethane	1	ND	ND	ND	ND
Chloroform	1	ND	ND	ND	ND
Dichlorodifluoromethane	1	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	1	ND	ND	ND	ND
1,2-Dichloroethane (1,2-DCA)	1	ND	ND	ND	ND
1,1-Dichloroethylene (1,1-DCE)	1	ND	ND	ND	ND
trans-1,2-Dichloroethylene	1	ND	ND	ND	ND
Dichloromethane (Methylene Chloride)	1	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	1	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND
Tetrachloroethylene (PCE)	1	ND	ND	ND	ND
1,1,1-Trichloroethane (111-TCA)	1	ND	ND	ND	ND
1,1,2-Trichloroethane (112-TCA)	1	ND	ND	ND	ND
Trichloroethylene (TCE)	1	ND	ND	ND	ND
Trichlorofluoromethane	1	ND	ND	ND	ND
Vinyl chloride	1	ND	ND	ND	ND
cis-1,2-Dichloroethylene	1	ND	ND	ND	ND
SURROGATE: 4-Bromofluorobenzene <sup>b</sup>		87.8	110	85.8	85.5

<sup>a</sup> Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA SW-846. Third Edition, Revision 1. US EPA July 1992/Organics in Water, EPA Method 601; "Test Procedures for Analysis of Organic Pollutants," Code of Federal Regulations, 40CFR Part 136, Appendix A, July 1992. <sup>b</sup> Surrogate recovery acceptability limits: 60-140%.

ND=Not Detected at or above the Reporting Limit





MATRIX ANALYTICAL SERVICES, INC.

Client: **Powerine Oil Company**  
 Project: **Powerine Refinery**  
 Project Location: **12354 Lakeland Rd., Santa Fe Springs**  
 Work Order Number: **MNOV1996**

ANALYTICAL RESULTS  
 Halogenated Volatile Organics by Gas Chromatography  
 EPA Method 8010<sup>a</sup>

Lab ID Number		13	14	15	16
Client Identification		LB8-5'	LB9-5'	LB10-5'	LB11-5'
Date Sampled		11/19/96	11/19/96	11/19/96	11/19/96
Date Analyzed		11/19/96	11/19/96	11/19/96	11/19/96
Reporting Limit Multiplier		1	1	1	1
Analyte	Reporting Limit, ug/L	Concentration, ug/L			
Freon 113	1	ND	ND	ND	ND
Carbon Tetrachloride	1	ND	ND	ND	ND
Chloroethane	1	ND	ND	ND	ND
Chloroform	1	ND	ND	ND	ND
Dichlorodifluoromethane	1	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	1	ND	ND	ND	ND
1,2-Dichloroethane (1,2-DCA)	1	ND	ND	ND	ND
1,1-Dichloroethylene (1,1-DCE)	1	ND	ND	ND	ND
trans-1,2-Dichloroethylene	1	ND	ND	ND	ND
Dichloromethane (Methylene Chloride)	1	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	1	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND
Tetrachloroethylene (PCE)	1	ND	ND	ND	ND
1,1,1-Trichloroethane (111-TCA)	1	ND	ND	ND	ND
1,1,2-Trichloroethane (112-TCA)	1	ND	ND	ND	ND
Trichloroethylene (TCE)	1	ND	ND	ND	ND
Trichlorofluoromethane	1	ND	ND	ND	ND
Vinyl chloride	1	ND	ND	ND	ND
cis-1,2-Dichloroethylene	1	ND	ND	ND	ND
SURROGATE: 4-Bromofluorobenzene <sup>b</sup>		99.8	103	86.2	80.0

<sup>a</sup> Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA SW-846. Third Edition, Revision 1. US EPA July 1992/Organics in Water, EPA Method 601; "Test Procedures for Analysis of Organic Pollutants," Code of Federal Regulations, 40CFR Part 136, Appendix A, July 1992. <sup>b</sup> Surrogate recovery acceptability limits: 60-140%.

ND=Not Detected at or above the Reporting Limit



MATRIX ANALYTICAL SERVICES, INC.

Client: **Powerine Oil Company**  
 Project: **Powerine Refinery**  
 Project Location: **12354 Lakeland Rd., Santa Fe Springs**  
 Work Order Number: **MNOV1996**

ANALYTICAL RESULTS  
 Halogenated Volatile Organics by Gas Chromatography  
 EPA Method 8010<sup>a</sup>

Lab ID Number	17	18	19	20	
Client Identification	LB12-5'	LB13-5'	LB13-5' DUP.	Ambient 1920	
Date Sampled	11/19/96	11/19/96	11/19/96	11/19/96	
Date Analyzed	11/19/96	11/19/96	11/19/96	11/19/96	
Reporting Limit Multiplier	1	1	1	1	
Analyte	Reporting Limit,ug/L	Concentration, ug/L			
Freon 113	1	ND	ND	ND	ND
Carbon Tetrachloride	1	ND	ND	ND	ND
Chloroethane	1	ND	ND	ND	ND
Chloroform	1	ND	ND	ND	ND
Dichlorodifluoromethane	1	ND	ND	ND	ND
1,1-Dichloroethane (1,1-DCA)	1	ND	ND	ND	ND
1,2-Dichloroethane (1,2-DCA)	1	ND	ND	ND	ND
1,1-Dichloroethylene (1,1-DCE)	1	ND	ND	ND	ND
trans-1,2-Dichloroethylene	1	ND	ND	ND	ND
Dichloromethane (Methylene Chloride)	1	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	1	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND
Tetrachloroethylene (PCE)	1	ND	ND	ND	ND
1,1,1-Trichloroethane (111-TCA)	1	ND	ND	ND	ND
1,1,2-Trichloroethane (112-TCA)	1	ND	ND	ND	ND
Trichloroethylene (TCE)	1	ND	ND	ND	ND
Trichlorofluoromethane	1	ND	ND	ND	ND
Vinyl chloride	1	ND	ND	ND	ND
cis-1,2-Dichloroethylene	1	ND	ND	ND	ND
SURROGATE: 4-Bromofluorobenzene <sup>b</sup>	86.5	85.5	93.5	90.5	

<sup>a</sup> Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA SW-846. Third Edition, Revision 1. US EPA July 1992/Organics in Water, EPA Method 601; "Test Procedures for Analysis of Organic Pollutants," Code of Federal Regulations, 40CFR Part 136, Appendix A, July 1992. <sup>b</sup> Surrogate recovery acceptability limits: 60-140%.

ND=Not Detected at or above the Reporting Limit



NOVEMBER 18, 1996

Method: D:\HPCHEM2\METHODS\NOV1896R.MTH

## ELCD Initial Calibration Table

Name	RT	ng	Amt/Area	Area	AVG RF	STD	RSD
DCDFM	4.836	20	2.20E-03	9075	1.77E-03	0.000253	14.3
		50	1.55E-03	32225			
		150	1.66E-03	90449			
		300	1.71E-03	175850			
		600	1.72E-03	349406			
Vinyl Chloride	5.539	20	6.14E-04	32589	6.83E-04	6.25E-05	9.2
		50	6.53E-04	76531			
		150	6.63E-04	226156			
		300	7.05E-04	425767			
		600	7.78E-04	770951			
Chloroethane	6.875	20	5.33E-04	37557	6.56E-04	9.37E-05	14.3
		50	5.97E-04	83748			
		150	6.68E-04	224423			
		300	7.15E-04	419598			
		600	7.69E-04	780407			
TCFM	7.602	20	1.09E-03	18287	1.30E-03	0.000122	9.4
		50	1.28E-03	38971			
		150	1.35E-03	111400			
		300	1.36E-03	220604			
		600	1.40E-03	427686			
Freon 113	9.057	20	4.23E-04	47260	5.76E-04	0.000103	17.9
		50	5.27E-04	94913			
		150	6.08E-04	246638			
		300	6.35E-04	472709			
		600	6.88E-04	872448			
1,1-DCE	9.596	20	3.38E-04	59259	4.23E-04	7.07E-05	16.7
		50	3.69E-04	135567			
		150	4.33E-04	346404			
		300	4.67E-04	642687			
		600	5.11E-04	1174306			
DCM (MeCl2)	11.117	20	2.49E-04	80334	3.29E-04	6.82E-05	20.7
		50	2.99E-04	167146			
		150	3.70E-04	405723			
		300	4.00E-04	750563			
		600	4.91E-04	1220852			
Trans 1,2-DCE	12.117	20	3.15E-04	63450	4.04E-04	7.28E-05	18.0
		50	3.46E-04	144409			
		150	4.17E-04	359350			
		300	4.50E-04	666252			
		600	4.91E-04	1220852			
1,1-DCA	13.327	20	3.45E-04	58040	4.33E-04	7.29E-05	16.8
		50	3.74E-04	133554			
		150	4.45E-04	337329			
		300	4.79E-04	626475			



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		600	5.21E-04	1151631			
Chloroform	15.073	20	3.90E-04	51297	4.81E-04	7.78E-05	16.2
		50	4.16E-04	120247			
		150	4.92E-04	304767			
		300	5.30E-04	566177			
		600	5.77E-04	1040763			
CIS-1,2-DCE	15.51	20	2.58E-04	77586	3.38E-04	6.58E-05	19.5
		50	2.88E-04	173394			
		150	3.45E-04	434518			
		300	3.78E-04	793105			
		600	4.20E-04	1427688			
1,1,1-TCA	16.63	20	3.10E-04	64423	3.84E-04	6.64E-05	17.3
		50	3.40E-04	146852			
		150	4.06E-04	369458			
		300	3.78E-04	793651			
		600	4.83E-04	1242236			
Carbon Tet.	17.314	20	2.83E-04	70604	3.57E-04	6.11E-05	17.1
		50	3.06E-04	163372			
		150	3.68E-04	407221			
		300	3.97E-04	756048			
		600	4.29E-04	1398601			
1,2-DCA	17.654	20	3.60E-04	55620	4.50E-04	8.27E-05	18.4
		50	3.77E-04	132573			
		150	4.54E-04	330164			
		300	5.07E-04	591786			
		600	5.53E-04	1084912			
TCE	19.307	20	3.00E-04	66587	3.85E-04	7.31E-05	19.0
		50	3.30E-04	151575			
		150	3.86E-04	388209			
		300	4.29E-04	698812			
		600	4.81E-04	1247583			
1,1,2-TCA	23.263	20	3.97E-04	50424	4.81E-04	8.18E-05	17.0
		50	4.21E-04	118686			
		150	4.63E-04	324156			
		300	5.25E-04	570928			
		600	5.98E-04	1002607			
PCE	24.104	20	2.85E-04	70131	3.71E-04	6.56E-05	17.7
		50	3.33E-04	149930			
		150	3.74E-04	401016			
		300	4.06E-04	738934			
		600	4.56E-04	1315991			
1,1,1,2-PCA	26.173	20	3.02E-04	66201	3.81E-04	6.61E-05	17.4
		50	3.31E-04	151030			
		150	3.83E-04	391788			
		300	4.25E-04	705716			
		600	4.64E-04	1294415			
1,1,2,2-PCA	28.714	20	6.38E-04	31350	6.90E-04	9.53E-05	13.8
		50	5.88E-04	85025			
		150	6.52E-04	230217			



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		300	7.45E-04	402436			
		600	8.27E-04	725786			
BFB	28.954	100	1.73E-03	57860	1.51E-03	0.000181	12.0
		200	1.68E-03	118723			
		300	0.00139	215827			
		400	1.33E-03	300323			
		500	1.43E-03	350656			

RT or Ret Time = Retention Time

ng = Standard mass

AVG RF or RF<sub>ave</sub> = Average Response Factor

STD or SD = Standard Deviation of RF

RSD = Percent Relative Standard Deviation

%DIFF=Percent difference between RF and RF<sub>ave</sub> from initial calibration



## MATRIX ANALYTICAL SERVICES, INC.

Data File Name : D:\HPCHEM\2\DATA\NOV 1996A\007R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 7  
 Sample Name : ACCU LCS Spike Amount : 200ng  
 Acquired on : 19 Nov 96 09:57 AM Instrument Method : NOV1896F.MTH  
 Report Created on : 19 Nov 96 02:21 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 0  
 Multiplier : 1 Surrogate Amount : 200ng

Sig. 2 in D:\HPCHEM\2\DATA\NOV1996A\007 R0101.D

Ret Time	Name	Area	ng	%REC
4.882	DCDFM	138245	235.77	118
5.619	Vinyl Chloride	277075	200.94	100
6.953	Chloroethane	284742	204.87	102
7.685	TCFM	166914	228.98	114
9.146	Freon 113	241653	150.13	75.1
9.679	1,1-DCE	367046	169.27	84.6
11.191	DCM (MeCl <sub>2</sub> )	454435	173.59	86.8
12.125	Trans 1,2-DCE	401738	179.04	89.5
13.391	1,1-DCA	413686	198.53	99.3
15.132	Chloroform	412274	221.42	111
15.567	CIS-1,2-DCE	494024	186.26	93.1
16.686	1,1,1-TCA	425274	186.64	93.3
17.372	Carbon Tet.	454721	178.05	89.0
17.705	1,2-DCA	371218	185.38	92.7
19.356	TCE	427261	182.77	91.4
23.304	1,1,2-TCA	360113	191.29	95.6
24.147	PCE	432556	176.08	88.0
26.213	1,1,1,2-PCA	435917	183.10	91.5
28.751	1,1,2,2-PCA	229925	168.95	84.5
28.988	BFB	112312	174.39	87.2



## MATRIX ANALYTICAL SERVICES, INC.

Data File Name : D:\HPCHEM\2\DATA\NOV 1996A\007 R0101.D  
Operator : Jow Detector : ELCD  
Instrument : PID/ELCD HP Vol. GC Vial Number : 7  
Sample Name : ACCU LCS Spike Amount : 200ug/L  
Acquired on : 19 Nov 96 09:57 AM Instrument Method : NOV1896F.MTH  
Report Created on : 22 Nov 96 08:06 AM Analysis Method : NOV1896R.MTH  
Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 0  
Multiplier : 1 Surrogate Amount : 200ng BFB

Sig. 2 in D:\HPCHEM\2\DATA\NOV1996A\007 R0101.D

Ret Time	Name	Area	RF	%DIFF
4.882	DCDFM	138245	1.45E-03	13.8
5.619	Vinyl Chloride	277075	7.22E-04	3.7
6.953	Chloroethane	284742	7.02E-04	4.5
7.685	TCFM	166914	1.20E-03	5.4
9.146	Freon 113	241653	8.28E-04	22.5
9.679	1,1-DCE	367046	5.45E-04	16.1
11.191	DCM (MeCl <sub>2</sub> )	454435	4.40E-04	18.3
12.125	Trans 1,2-DCE	401738	4.98E-04	13.4
13.391	1,1-DCA	413686	4.83E-04	7.3
15.132	Chloroform	412274	4.85E-04	0.6
15.567	CIS-1,2-DCE	494024	4.05E-04	11.7
16.686	1,1,1-TCA	425274	4.70E-04	13.1
17.372	Carbon Tet.	454721	4.40E-04	13.4
17.705	1,2-DCA	371218	5.39E-04	11.6
19.356	TCE	427261	4.68E-04	12.5
23.304	1,1,2-TCA	360113	5.55E-04	9.4
24.147	PCE	432556	4.62E-04	14.1
26.213	1,1,1,2-PCA	435917	4.59E-04	12.0
28.751	1,1,2,2-PCA	229925	8.70E-04	14.8
28.988	BFB	112312	1.78E-03	10.6



## MATRIX ANALYTICAL SERVICES, INC.

Data File Name : C:\HPCHEM\2\DATA\NOV 1996\003R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 3  
 Sample Name : SYRING BLANK 5ML Injection Number : 1  
 Acquired on : 19 Nov 96 07:03 AM Instrument Method : NOV1896F.MTH  
 Report Created on : 29 Nov 96 03:10 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 0  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996\003R 0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.117	DCM (MeCl <sub>2</sub> )	not found	
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
28.981	BFB	125123	38.22





Data File Name : C:\HPCHEM\2\DATA\NOV 1996\005R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 5  
 Sample Name : AMBIENT/0700 5CC Injection Number : 1  
 Acquired on : 19 Nov 96 08:14 AM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:25 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996\005R 0101.D

Ret Time	Name	Area	ug/L
4.878	DCDFM	2889	0.91
5.556	Vinyl Chloride	5161	0.44
6.924	Chloroethane	3170	0.26
7.602	TCFM	not found	
9.138	Freon 113	11279	0.80
9.672	1,1-DCE	4362	0.21
11.203	DCM (MeCl <sub>2</sub> )	9858	0.44
12.129	Trans 1,2-DCE	3764	0.17
13.401	1,1-DCA	2767	0.14
15.144	Chloroform	2148	0.12
15.582	CIS-1,2-DCE	3449	0.13
16.7	1,1,1-TCA	4441	0.20
17.38	Carbon Tet.	4881	0.21
17.716	1,2-DCA	2383	0.12
19.366	TCE	4139	0.17
23.317	1,1,2-TCA	1797	0.09
24.158	PCE	5807	0.24
26.226	1,1,1,2-PCA	2353	0.10
28.714	1,1,2,2-PCA	not found	
28.996	BFB	106299	33.31



Data File Name : C:\HPCHEM\2\DATA\NOV 1996\006R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 6  
 Sample Name : EQUIP BLANK Injection Number : 1  
 Acquired on : 19 Nov 96 09:18 AM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:28 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996\006R 0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.204	DCM (MeCl <sub>2</sub> )	2334	0.10
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
28.995	BFB	97819	31.10



Data File Name : C:\HPCHEM\2\DATA\NOV 1996A\008R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 8  
 Sample Name : LB5-5' 2VOL 5CC Injection Number : 1  
 Acquired on : 19 Nov 96 10:33 AM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:30 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996A\008 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.204	DCM (MeCl <sub>2</sub> )	2061	0.09
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
28.992	BFB	94279	30.18



MATRIX ANALYTICAL SERVICES, INC.

Data File Name : C:\HPCHEM\2\DATA\NOV 1996B\009R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 9  
 Sample Name : LB5-5' 4VOL 5CC Injection Number : 1  
 Acquired on : 19 Nov 96 11:10 AM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:32 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996B\009 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.213	DCM (MeCl2)	2453	0.11
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
28.996	BFB	98776	31.35



Data File Name : C:\HPCHEM2\DATA\NOV 1996B\010R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 10  
 Sample Name : LB5-5' 1MIN=8VOL 5CC Injection Number : 1  
 Acquired on : 19 Nov 96 11:45 AM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:35 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM2\DATA\NOV1996B\010 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.207	DCM (MeCl <sub>2</sub> )	2679	0.12
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
28.998	BFB	108005	33.76



Data File Name : C:\HPCHEM\2\DATA\NOV 1996B\011R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 11  
 Sample Name : LB1-5' 5CC Injection Number : 1  
 Acquired on : 19 Nov 96 12:29 PM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:36 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996B\011 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.222	DCM (MeCl <sub>2</sub> )	2018	0.09
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
29.001	BFB	106349	33.32



MATRIX ANALYTICAL SERVICES, INC.

Data File Name : C:\HPCHEM\2\DATA\NOV 1996B\012R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 12  
 Sample Name : LB2-5' 5CC Injection Number : 1  
 Acquired on : 19 Nov 96 01:05 PM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:37 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996B\012 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.217	DCM (MeCl <sub>2</sub> )	2118	0.09
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
29	BFB	110924	34.52



## MATRIX ANALYTICAL SERVICES, INC.

Data File Name : C:\HPCHEM\2\DATA\NOV 1996C\013R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 13  
 Sample Name : LB3-5' 5CC Injection Number : 1  
 Acquired on : 19 Nov 96 01:51 PM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:38 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996C\013 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.236	DCM (MeCl <sub>2</sub> )	2041	0.09
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
29.008	BFB	113237	35.12





Data File Name : C:\HPCHEM\2\DATA\NOV 1996C\014R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 14  
 Sample Name : LB4-5' 5CC Injection Number : 1  
 Acquired on : 19 Nov 96 02:29 PM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:40 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996C\014 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.227	DCM (MeCl <sub>2</sub> )	2655	0.12
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
29.01	BFB	146816	43.87



Data File Name : C:\HPCHEM2\DATA\NOV 1996C\015R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 15  
 Sample Name : LB6-5' 5cc Injection Number : 1  
 Acquired on : 19 Nov 96 03:05 PM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:41 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM2\DATA\NOV1996C\015 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.237	DCM (MeCl <sub>2</sub> )	2334	0.10
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
29.008	BFB	110213	34.33



Data File Name : C:\HPCHEM\2\DATA\NOV 1996C\016R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 16  
 Sample Name : LB7-5' 5CC Injection Number : 1  
 Acquired on : 19 Nov 96 03:41 PM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:48 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996C\016 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.231	DCM (MeCl <sub>2</sub> )	2141	0.10
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
29.01	BFB	109832	34.23



Data File Name : C:\HPCHEM2\DATA\NOV 1996C\017R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 17  
 Sample Name : LB8-5' 5cc Injection Number : 1  
 Acquired on : 19 Nov 96 04:17 PM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:49 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM2\DATA\NOV1996C\017 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.233	DCM (MeCl <sub>2</sub> )	2562	0.11
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
29.008	BFB	131626	39.91



MATRIX ANALYTICAL SERVICES, INC.

Data File Name : C:\HPCHEM\2\DATA\NOV 1996C\018R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 18  
 Sample Name : LB9-5' 5CC Injection Number : 1  
 Acquired on : 19 Nov 96 04:52 PM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:50 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996C\018 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.234	DCM (MeCl <sub>2</sub> )	2556	0.11
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
29.01	BFB	136704	41.24



Data File Name : C:\HPCHEM\2\DATA\NOV 1996\019R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 19  
 Sample Name : LB10-5' 5CC Injection Number : 1  
 Acquired on : 19 Nov 96 05:28 PM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:52 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996\019 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.226	DCM (MeCl <sub>2</sub> )	1984	0.09
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
29.006	BFB	110733	34.47



Data File Name : C:\HPCHEM\2\DATA\NOV 1996C\020R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 20  
 Sample Name : LB11-5' 5CC Injection Number : 1  
 Acquired on : 19 Nov 96 06:03 PM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:53 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996C\020 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.584	Vinyl Chloride	1529	0.13
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.117	DCM (MeCl <sub>2</sub> )	not found	
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.729	1,2-DCA	2525	0.13
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
29	BFB	101157	31.97



Data File Name : C:\HPCHEM\2\DATA\NOV 1996C\022R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 22  
 Sample Name : LB13-5' 5CC Injection Number : 1  
 Acquired on : 19 Nov 96 07:14 PM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:55 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996C\022 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.117	DCM (MeCl <sub>2</sub> )	not found	
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
29	BFB	109665	34.19





Data File Name : C:\HPCHEM\2\DATA\NOV 1996C\023R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 23  
 Sample Name : LB13-5' DUP 5CC Injection Number : 1  
 Acquired on : 19 Nov 96 07:49 PM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:56 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996C\023 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.117	DCM (MeCl <sub>2</sub> )	not found	
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
29.006	BFB	122188	37.45



Data File Name : C:\HPCHEM\2\DATA\NOV 1996\024R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD Vial Number : 24  
 Sample Name : AMBIENT 1920 HRS Injection Number : 1  
 Acquired on : 19 Nov 96 08:24 PM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 09:57 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 5mL  
 Multiplier : 0.2 Surrogate Amount : 40.0

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996\024 R0101.D

Ret Time	Name	Area	ug/L
4.836	DCDFM	not found	
5.539	Vinyl Chloride	not found	
6.875	Chloroethane	not found	
7.602	TCFM	not found	
9.057	Freon 113	not found	
9.596	1,1-DCE	not found	
11.117	DCM (MeCl <sub>2</sub> )	not found	
12.117	Trans 1,2-DCE	not found	
13.327	1,1-DCA	not found	
15.073	Chloroform	not found	
15.51	CIS-1,2-DCE	not found	
16.63	1,1,1-TCA	not found	
17.314	Carbon Tet.	not found	
17.654	1,2-DCA	not found	
19.307	TCE	not found	
23.263	1,1,2-TCA	not found	
24.104	PCE	not found	
26.173	1,1,1,2-PCA	not found	
28.714	1,1,2,2-PCA	not found	
28.997	BFB	117415	36.21



Data File Name : C:\HPCHEM\2\DATA\NOV 1996D\027 R0101.D  
 Operator : Jow Detector : ELCD  
 Instrument : PID/ELCD HP Vol. GC Vial Number : 27  
 Sample Name : END OF DAY CS (mid-pt) Spike Amount : 1  
 Acquired on : 20 Nov 96 01:25 PM Instrument Method : NOV1896F.MTH  
 Report Created on : 30 Nov 96 10:11 PM Analysis Method : NOV1896R.MTH  
 Last Recalib on : 18 NOV 96 10:23 PM Sample Amount : 0  
 Multiplier : 1 Surrogate Amount : 200

Sig. 2 in C:\HPCHEM\2\DATA\NOV1996D\027 R0101.D

Ret Time	Name	Area	RF	%DIFF
4.893	DCDFM	105241	1.90E-03	4.8
5.625	Vinyl Chloride	250955	7.97E-04	10.0
6.963	Chloroethane	282248	7.09E-04	5.0
7.697	TCFM	165381	1.21E-03	4.7
9.153	Freon 113	304027	6.58E-04	8.6
9.689	1,1-DCE	406840	4.92E-04	9.7
11.195	DCM (MeCl <sub>2</sub> )	488936	4.09E-04	13.9
12.131	Trans 1,2-DCE	425839	4.70E-04	9.8
13.402	1,1-DCA	400747	4.99E-04	9.3
15.141	Chloroform	358919	5.57E-04	9.6
15.577	CIS-1,2-DCE	509828	3.92E-04	9.7
16.695	1,1,1-TCA	436079	4.59E-04	9.5
17.379	Carbon Tet.	487409	4.10E-04	9.1
17.713	1,2-DCA	381706	5.24E-04	9.8
19.362	TCE	449066	4.45E-04	9.4
23.31	1,1,2-TCA	373375	5.36E-04	7.1
24.152	PCE	486185	4.11E-04	6.8
26.217	1,1,1,2-PCA	456530	4.38E-04	9.1
28.756	1,1,2,2-PCA	239844	8.34E-04	12.2
28.988	BFB	119172	1.68E-03	6.8



## Standards Concentrations (STD CONC) and Volumes (of STD CONC)

## Calibration Source:

Solution	4 Gases	Freon 113	VOC Mix 18			
Name of Supplier	Ultra Scientific	Ultra Scientific	Ultra Scientific			
Lot Number	K-1200	K-0968	K-1176			
ID number or other ID	CUS-1919	HC-480	CUS-1920			
Concentration of Standard	10ug/mL	10ug/mL	10ug/mL			
Volume STD Used for all 3	1uL	2uL	5uL	15uL	30uL	60uL
Calculated concentration	10ng	20ng	50ng	150ng	300ng	600ng

## Second Source:

Solution	Cust. Gas Mix	Custom VOC Mix			
Name of Supplier	Accustandard	Accustandard			
Lot Number	A6090095	A6090078			
ID number or other ID	S-2713B	S-2713A			
Concentration of Standard	100ug/mL	100ug/mL			
Volume of STD Used	2uL	2uL			
Calculated concentration	200ng	200ng			
	5 compounds	18 compounds			



APPENDIX D

BOREHOLE LOGS  
HVOC INVESTIGATION  
POWERINE REFINERY  
SANTA FE SPRINGS, CA

LOG-OF-BOREHOLE			
PROJECT: Powerine/HVOC			JOB #: 063-007
TOTAL DEPTH: 21' BOREHOLE DIA.: 1.25" CASING DIA.: None		DATE: 11/22/96 RIG: GEOPROBE 5400	BOREHOLE: LBS-5
DEPTH	MATERIAL	TOVS	DESCRIPTION AND COMMENTS
1-3'	CL/CH	> 2000	Black silty clay; wet to saturated; 2 sleeves.
4-6'	CL/CH	> 2000	Dark gray silty clay; wet; 3 sleeves.
9-11'	ML	47	Olive gray very fine sandy silt; damp; 3 sleeves.
14-16'	ML/SM	13	Olive gray very fine sandy silt; damp; grades to silty very fine sand; 3 sleeves.
19-21'	ML/SM	31	Dark greenish gray, very fine sandy silt to silty very fine sand; damp; 3 sleeves.
			Refusal at 21' in very dense sand.

LOG-OF-BOREHOLE			
PROJECT: Powerine/HVOC			JOB #: 063-007
TOTAL DEPTH: 25' BOREHOLE DIA.: 1.25" CASING DIA.: None		DATE: 11/22/96 RIG: GEOPROBE 5400	BOREHOLE: LBS-10
DEPTH	MATERIAL	TOVS	DESCRIPTION AND COMMENTS
1-3'	CL/CH	> 2000	Very dark olive gray silty clay; wet; 2 sleeves.
4-6'	CL/CH	> 2000	Very dark olive gray silty clay; wet; 2 sleeves.
9-11'	CL/CH	> 2000	Very dark olive gray silty clay; wet; 3 sleeves.
14-16'	SM	> 2000	Grayish brown silty very fine sand; dry to damp; 3 sleeves.
19-21'	ML/SM	> 2000	Olive gray silty very fine sand to very fine sandy silt; damp. Could not drive sample at 25'; 3 sleeves.
			Refusal at 25' in very dense sand.

LOG-OF-BOREHOLE			
PROJECT: Powerine/HVOC			JOB #: 063-007
TOTAL DEPTH: 22' BOREHOLE DIA.: 1.25" CASING DIA.: None		DATE: 11/22/96 RIG: GEOPROBE 5400	BOREHOLE: LBS-11
DEPTH	MATERIAL	TOVS	DESCRIPTION AND COMMENTS
1-3'	CL/CH	264	Dark olive gray silt clay; saturated; 3 sleeves.
4-6'	CL/CH	9	Olive gray silty clay; saturated; 3 sleeves.
9-11'	ML/MH	67	Dark gray clayey silt; wet; 3 sleeves.
14-16'	ML/SM	22	Greenish gray silty very fine sand to very fine sandy silt; damp; 3 sleeves.
20-22'	ML/SM	27	Greenish gray, very fine sandy silt to silty very fine sand; moist; 3 sleeves.
			Refusal at 22' in very dense sand.

APPENDIX E

SOIL ANALYTICAL DATA (EPA METHOD 8010)  
HVOCS INVESTIGATION  
POWERINE REFINERY  
SANTA FE SPRINGS, CA

# JONES ENVIRONMENTAL TESTING LABORATORIES

## JONES ENVIRONMENTAL LABORATORY RESULTS

**Client:** Tri-Hydro Corp.  
**Client Address:** 920 Sherdan St.  
Laramie, WY 82070

**Report Date:** 11/25/96  
**JEL Ref. No.:** B-1445  
**Client Ref. No.:**

**Attn:** Charlie DeWolf  
**Project:** Powerine Oil  
**Project Address:** Santa Fe Springs, CA

**Date Sampled:** 11/21-22/96  
**Date Received:** 11/22/96  
**Date Analyzed:** 11/22/96  
**Physical State:** Soil

### EPA 8010 - Volatile Halogenated Hydrocarbons

Parameter	Sample ID Concentration (ug/Kg)			
	LBS-5@5'	LBS-5@20'	LBS-10@5'	LBS-10@20'
Dichlorodifluoromethane	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND
1,1-Dichloroethylene	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND
t-1,2-Dichloroethylene	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND
c-1,2-Dichloroethylene	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND
Trichloroethylene	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND
c-1,3-Dichloropropylene	ND	ND	ND	ND
t-1,3-Dichloropropylene	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND
Tetrachloroethylene	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND
Reporting Limits:	1.0	1.0	1.0	1.0
Surrogate Recovery % #1	90	105	81	95
Surrogate Recovery % #2	67	97	49*	62
Surrogate Recovery % #3	75	114	42*	65

ND = Not Detected

P.O. BOX 5387  
FULLERTON, CA 92635

714-449-9937  
FAX # 714-449-9685

\* High amounts of hydrocarbons in this sample lowered surrogate recoveries.



# JONES ENVIRONMENTAL TESTING LABORATORIES

## JONES ENVIRONMENTAL LABORATORY RESULTS

<b>Client:</b>	Tri-Hydro Corp.	<b>Report Date:</b>	11/25/96
<b>Client Address:</b>	920 Sherdan St. Laramie, WY 82070	<b>JEL Ref. No.:</b>	B-1445
		<b>Client Ref. No.:</b>	
<b>Attn:</b>	Charlie DeWolf	<b>Date Sampled:</b>	11/21-22/96
		<b>Date Received:</b>	11/22/96
<b>Project:</b>	Powerine Oil	<b>Date Analyzed:</b>	11/22/96
<b>Project Address:</b>	Santa Fe Springs, CA	<b>Physical State:</b>	Soil

### EPA 8010 - Volatile Halogenated Hydrocarbons

Parameter	Sample ID Concentration (ug/Kg)	
	<u>LBS-11@5'</u>	<u>LBS-11@24'</u>
Dichlorodifluoromethane	ND	ND
Chloromethane	ND	ND
Vinyl Chloride	ND	ND
Bromomethane	ND	ND
Chloroethane	ND	ND
Trichlorofluoromethane	ND	ND
1,1-Dichloroethylene	ND	ND
Methylene Chloride	ND	ND
t-1,2-Dichloroethylene	ND	ND
1,1-Dichloroethane	ND	ND
c-1,2-Dichloroethylene	ND	ND
Chloroform	ND	ND
1,1,1-Trichloroethane	ND	ND
Carbon Tetrachloride	ND	ND
1,2-Dichloroethane	ND	ND
Trichloroethylene	ND	ND
1,2-Dichloropropane	ND	ND
Bromodichloromethane	ND	ND
c-1,3-Dichloropropylene	ND	ND
t-1,3-Dichloropropylene	ND	ND
1,1,2-Trichloroethane	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND
Dibromochloromethane	ND	ND
Chlorobenzene	ND	ND
Tetrachloroethylene	ND	ND
Bromoform	ND	ND
1,3-Dichlorobenzene	ND	ND
1,4-Dichlorobenzene	ND	ND
1,2-Dichlorobenzene	ND	ND
Reporting Limits:	1.0	1.0
Surrogate Recovery % #1	91	90
Surrogate Recovery % #2	58*	73
Surrogate Recovery % #3	53*	104

ND = Not Detected \* High amounts of hydrocarbons in this sample lowered surrogate recoveries  
 P.O. BOX 5387  
 PULLERTON, CA 92655

714-449-9937

FAX # 714-449-9685

# JONES ENVIRONMENTAL TESTING LABORATORIES

## JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

**Client:** Tri-Hydro Corp.  
**Client Address:** 920 Sheridan St.  
Laramie, WY 82070

**Report Date:** 11/25/96  
**JEL Ref. No.:** B-1445  
**Client Ref. No.:**

**Attn:** Charlie DeWolf  
**Project:** Powerine Oil  
**Project Address:** Santa Fe Springs, CA

**Date Sampled:** 11/21-22/96  
**Date Received:** 11/22/96  
**Date Analyzed:** 11/22/96  
**Physical State:** Soil

### EPA 8010 - Volatile Halogenated Hydrocarbons

**Sample Spiked:** LBS-11@21'

<u>Parameter</u>	<u>MS Recovery</u>	<u>MSD Recovery</u>	<u>RPD</u>	<u>Acceptability Range (%)</u>
1,1-DCE	96%	100%	4.3%	65 - 125
TCE	126%	132%	4.7%	65 - 125
CLBZ	108%	117%	7.5%	65 - 125

Method Blank = Not Detected

MS = Matrix Spike  
MSD = Matrix Spike Duplicate  
RPD = Relative Percent Difference

APPENDIX F

CHAIN-OF-CUSTODY FORMS  
SOIL ANALYSES  
HVOC INVESTIGATION  
POWERINE REFINERY  
SANTA FE SPRINGS, CA  
SOIL SAMPLING